

### Warm-up

Solve

$$2x^3 + 8x^2 - 4x = 0$$

$$2x(x^2 + 4x - 2) = 0$$

$$x = 0$$

$$-4 \pm \sqrt{16 - 4(1)(-2)}$$

$$\frac{-4 \pm \sqrt{24}}{2} = \frac{-4 \pm 2\sqrt{6}}{2} = -2 \pm \sqrt{6}$$

$$\sqrt{24} = \sqrt{4 \cdot 6} = 2\sqrt{6}$$

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### 8-3 Rational Functions

Classify rational functions as continuous or discontinuous

Graph each:

$$x + 1 = 0$$

$$x = -1$$

$$1) y = \frac{(x+2)(x-1)}{(x+1)} = 0$$

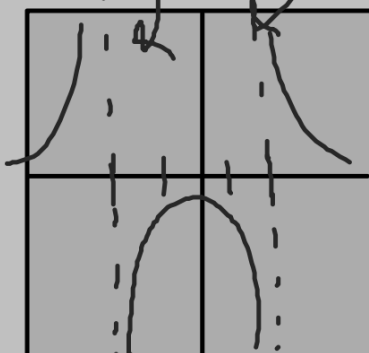


Discont.

$$x^2 - 4 = 0$$

$$x = \pm 2$$

$$2) y = \frac{1}{(x^2 - 4)}$$

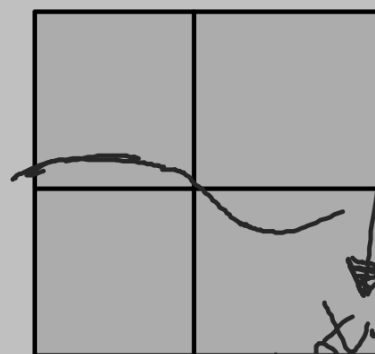


Discont.

$$x^2 + 1 = 0$$

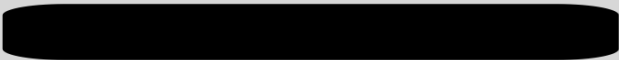
$$x = \pm i$$

$$3) y = \frac{-2x}{(x^2 + 1)}$$



Cont.

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Continuous - graph has No breaks, jumps, or holes

Discontinuous - is broken or jumps at the real values for which the graph is undefined.  

Ex 1

$$y = \frac{x}{x-4}$$

$+4 \quad +4$   
 $x = 4$   
D: SC

Ex 2

$$y = \frac{-x+1}{x^2+8} = 0$$

$$x^2 = 8$$

$$x = \pm 2.82$$

cont.

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Ex 3

$$y = \frac{0}{x^2+2x+1} = 0$$

$$(x+1)(x+1) = 0$$

$$x = -1, -1$$

Disc

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Ex 4

$$y = \frac{\cancel{x^2}}{x^2 - 16} = 0$$
$$\sqrt{x^2} = \sqrt{16}$$
$$x = \pm 4$$

D.S. 4

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Ex 5

$$y = \frac{x^2 - 1}{x^2 + 5}$$

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Ex 6

$$y = \frac{\cancel{2+1}}{x^2 + 2x - 6} = 0$$

$$\frac{-2 \pm \sqrt{4 - 4(1)(-6)}}{2}$$

$$\frac{-2 \pm \sqrt{28}}{2} = \frac{-2 \pm 2\sqrt{7}}{2}$$

$$\frac{-1 \pm \sqrt{7}}{1}$$

$$\sqrt{28} = \sqrt{4 \cdot 7} = 2\sqrt{7}$$

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Questions....



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## *Homework*

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